

DRUGS & ANTIDOTES



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Drug Antidotes

Drug	Antidote
Acetaminophen	Acetylcysteine
Anticholinergics	Physostigmine
Benzodiazepines	Flumazenil
Ca Channel Blockers	Calcium Chloride
Cyanide	Hydroxocobalamin Amyl Nitrite, Sodium Nitrite, Sodium Thiosulfate
Digoxin	Digoxin Immune Fab
Heparin	Protamine Sulfate
Iron	Deferoxamine
Insulin	Glucagon
Lead	Dimercaptosuccinic Acid/EDTA
Opioids	Naloxone
Warfarin	Vitamin K

Agent	Antidote	Dosage
Acetaminophen	Acetylcysteine (Acetadote, Mucomyst)	PO: ADULTS, CHILDREN: Loading dose: 140 mg/kg, then 70 mg/kg q4h for a total of 18 doses. Total dose delivered: 1,330 mg/kg. IV: ADULTS, CHILDREN: Loading dose: 150 mg/kg over 60 min, then 50 mg/kg over 4 hrs, then 100 mg/kg over 16 hrs. Total dose delivered: 300 mg/kg.
Anticholinergic agents (e.g., atropine)	Physostigmine	IM/IV/SUBCUTANEOUS: ADULTS: Initially, 0.5–2 mg, then repeat q20min until response occurs or adverse effects occur. Repeat 1–4 mg q30–60min as life-threatening symptoms recur. IV: CHILDREN (Reserve for life-threatening situation only): 0.01–0.03 mg/kg/dose. May repeat after 15–20 min to maximum total dose of 2 mg, or until response occurs or adverse cholinergic effects occur.
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Arsenic	Dimercaprol (BAL in oil)	Mild Poisoning IM: ADULTS, CHILDREN: 2.5 mg/kg/dose q6h for 2 days, then q12h for 1 day, then once daily for 10 days. Severe Poisoning IM: ADULTS, CHILDREN: 3 mg/kg/dose q4h for 2 days, then q6h for 1 day, then q12h for 10 days.
Benzodiazepines (e.g., midazolam)	Flumazenil (Romazicon)	IV: ADULTS: 0.2 mg over 30 sec. May give 0.3-mg dose after 30 sec if desired LOC not obtained. Additional doses of 0.5 mg can be given over 30 sec at 1-min intervals up to cumulative dose of 3 mg. CHILDREN: 0.01 mg/kg (maximum : 0.2 mg) with repeat doses of 0.01 mg/kg (maximum : 0.2 mg) given every minute to maximum total cumulative dose of 1 mg.
Beta blockers (e.g., propranolol)	Glucagon	IV: ADULTS: 5–10 mg over 1 min, followed by infusion of 1–10 mg/hr.
Calcium channel blockers (e.g., verapamil)	Glucagon	IV: ADULTS: 5–10 mg over 1 min, followed by infusion of 1–10 mg/hr.

Agent	Antidote	Dosage
Carbamate pesticides	Atropine	<p>IV: ADULTS: Initially, 1–5 mg doubled q5min until signs of muscarinic excess abate.</p> <p>IV INFUSION: ADULTS: 0.5–1 mg/hr.</p> <p>IM: ADULTS (Mild symptoms): 2 mg. If severe symptoms develop after first dose, 2 additional doses should be repeated in 10 min. (Severe symptoms): Immediately administer three 2-mg doses.</p> <p>IV: CHILDREN: 0.02–0.05 mg/kg q10–20min until atropine effect observed, then q1–4h for at least 24 hrs.</p> <p>IM: 0.5–2 mg/dose based on weight (0.5 mg: 15–40 lb, 1 mg: 41–90 lb, 2 mg: greater than 90 lb). (Mild symptoms): 1 injection. (Severe symptoms): 2 additional injections given in rapid succession 10 min after receiving first injection.</p>
Digoxin (Lanoxin)	Digoxin immune FAB (Digibind)	<p>ADULTS</p> <p>Unknown amount of ingestion: 800 mg IV infusion if acute ingestion, 240 mg IV infusion if chronic ingestion.</p> <p>Dosing for Ingestion of Single Large Dose</p> <p>Dose (in no. of vials) = (Total digitalis body load in mg)/(0.5 mg of digitalis bound per vial).</p> <p>Total digitalis body load in mg = (No. of tablets/capsules ingested) \times (mg strength of tablet/capsule) \times (bioavailability of tablet/capsule).</p> <p>Digoxin tablets and elixir are 80% bioavailable.</p> <p>Digoxin capsules and injection are 100% bioavailable.</p> <p>Dosing Based on Serum Level</p> <p>Digoxin: Dose (in no. of vials) = (Serum digoxin level in ng/mL) \times (weight in kg)/(100).</p> <p>Digitoxin: Dose (in no. of vials) = (Serum digitoxin level in ng/mL) \times (weight in kg)/(1,000).</p> <p>CHILDREN</p> <p>Dosing for Ingestion of Single Large Dose</p> <p>Dose (in no. of vials) = (Total digitalis body load in mg)/(0.5 mg of digitalis bound per vial).</p> <p>Total digitalis body load in mg = (No. of tablets/capsules ingested) \times (mg strength of tablet/capsule) \times (bioavailability of tablet/capsule).</p> <p>Digoxin tablets and elixir are 80% bioavailable.</p> <p>Digoxin capsules and injection are 100% bioavailable.</p> <p>WEIGHING 20 kg or less: Dilution of reconstituted vial to 1 mg/ml may be desirable for doses of 3 mg or less.</p> <p>Dose (in no. of mg) = Dose (in no. of vials) \times 38 mg/vial.</p> <p>Dose (in no. of vials) = (Serum digoxin level in ng/ml) \times (weight in kg)/(100).</p>

Poisoning Agent	Antidote	Dosage
Ethylene glycol	Fomepizole (Antizol)	IV: ADULTS, CHILDREN: Loading dose 15 mg/kg, then 10 mg/kg q12h for 4 doses, then 15 mg/kg q12h thereafter until ethylene glycol levels reduced to less than 20 mg/dl and patient is asymptomatic with normal pH.
Extravasation vasoconstrictive agents (e.g., dopamine)	Phentol-amine (Regitine)	ADULTS, CHILDREN: Infiltrate area with small amount of solution made by diluting 5–10 mg in 10 ml 0.9% NaCl within 12 hrs of extravasation. In general, do not exceed 0.1–0.2 mg/kg (5 mg total).
Heparin	Protamine	IV: ADULTS, CHILDREN: Dosage is determined by most recent dosage of heparin or low molecular weight heparin (LWH): 1 mg protamine neutralizes 90–115 units of heparin and 1 mg (100 units) of LWH. Maximum dose: 50 mg.
Iron	Deferox-amine (Desferal)	<p>Acute</p> <p>IM: ADULTS: Initially, 1,000 mg, then 500 mg q4h for 2 doses. Additional doses of 0.5 g q4–12h. Maximum: 6 g/24 hrs.</p> <p>CHILDREN 3 YRS AND OLDER: 90 mg/kg/dose q8h (not to exceed 1 g/dose). Maximum: 6 g/24 hrs.</p> <p>IV: ADULTS, CHILDREN: 15 mg/kg/hr. Maximum: 6 g/24 hrs.</p> <p>Chronic</p> <p>IM: ADULTS: 500–1,000 mg/day.</p> <p>IV: ADULTS, CHILDREN: 15 mg/kg/hr. Maximum: 12 g/24 hrs.</p>
Isoniazid	Pyridoxine (vitamin B ₆)	IV: ADULTS, CHILDREN: Total dose of pyridoxine equal to amount of isoniazid ingested as first dose of 1–4 g IV, then 1 g IM q30min until total dose completed. If not known, give 5 g at rate of 1 g/min. May repeat q5–10min.
Lead	Calcium EDTA	<p>Symptomatic</p> <p>Treat for 3–5 days; give in conjunction with dimercaprol.</p> <p>IM: ADULTS, CHILDREN: 167 mg/m² q4h.</p> <p>IV: ADULTS, CHILDREN: 1 g/m² as 8- to 24-hr infusion or divided q12h.</p> <p>Lead Encephalopathy</p> <p>Treat for 5 days; give concurrently with dimercaprol.</p> <p>IM: ADULTS, CHILDREN: 250 mg/m² q4h.</p> <p>IV: ADULTS, CHILDREN: 50 mg/kg/day as 24-hr continuous infusion.</p>

Continued

Poisoning Agent	Antidote	Dosage
Lead	Dimercaprol (BAL in oil)	<p>Mild</p> <p>IM: ADULTS, CHILDREN: Loading dose 4 mg/kg, then 3 mg/kg/dose q4h for 2–7 days. Begin calcium EDTA with second dose.</p> <p>Severe and Lead Encephalopathy</p> <p>IM: ADULTS, CHILDREN: 4 mg/kg/dose q4h for 3–5 days. Begin calcium EDTA with second dose.</p>
Lead	Succimer (Chemet)	<p>PO: ADULTS, CHILDREN: 10 mg/kg/dose q8h for 5 days, then q12h for 14 days. Maximum: 500 mg/dose. Note: For children younger than 5 yrs, dose based on mg/m².</p>
Methanol	Fomepizole (Antizol)	<p>IV: ADULTS, CHILDREN: Loading dose 15 mg/kg, then 10 mg/kg q12h for 4 doses, then 15 mg/kg q12h thereafter until ethylene glycol levels reduced to less than 20 mg/dl and patient is asymptomatic with normal pH.</p>
Opioids (e.g., morphine)	Naloxone (Narcan)	<p>IV/IM/SUBCUTANEOUS: ADULTS: 0.4–2 mg/dose. May repeat every 2–3 min as needed. Therapy may need to be reassessed if no response is seen after cumulative dose of 10 mg.</p> <p>CHILDREN (5 YRS OR OLDER or WEIGHING 20 KG OR GREATER): 2 mg/dose IV/IM/SUBCUTANEOUS. May repeat every 2–3 min as needed. Therapy may need to be reassessed if no response is seen after cumulative dose of 10 mg.</p> <p>CHILDREN (WEIGHING LESS THAN 20 KG): 0.1 mg/kg/dose. May repeat every 2–3 min as needed.</p>
Organophosphate pesticides	Atropine	<p>IV: ADULTS: Initially, 1–5 mg doubled q5min until signs of muscarinic excess abate.</p> <p>IV INFUSION: ADULTS: 0.5–1 mg/hr.</p> <p>IM: ADULTS (Mild symptoms): 2 mg. If severe symptoms develop after first dose, 2 additional doses should be repeated in 10 min. (Severe symptoms): Immediately administer three 2-mg doses.</p> <p>IV: CHILDREN: 0.02–0.05 mg/kg q10–20min until atropine effect observed, then q1–4h for at least 24 hrs.</p> <p>IM: 0.5–2 mg/dose based on weight (0.5 mg: 15–40 lb, 1 mg: 41–90 lb, 2 mg: greater than 90 lb). (Mild symptoms): 1 injection. (Severe symptoms): 2 additional injections given in rapid succession 10 min after receiving first injection.</p>

Poisoning

Agent

Antidote

Dosage

Organophosphate pesticides

Pralidoxime (Protopam)

IM/IV: ADULTS: 1–2 g. Repeat in 1–2 hrs if muscle weakness has not been relieved, then at 10- to 12-hr intervals if cholinergic signs recur.
 CHILDREN: 20–50 mg/kg/dose. Repeat in 1–2 hrs if muscle weakness is not relieved, then at 10- to 12-hr intervals if cholinergic signs recur.

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Warfarin (Coumadin)

Phytonadione (vitamin K)

PO/IV/SUBCUTANEOUS: ADULTS: 2.5–10 mg/dose. May repeat in 12–48 hrs if given PO, 6–8 hrs if given by IV or subcutaneous route.
 CHILDREN: 0.5–5 mg depending on need for further anticoagulation, severity of bleeding.